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## Risks and Hazards Analysis

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### Hand Washing

Hand-washing facilities must be provided for the exclusive use of food handlers. Potable, running water must be used for hand washing, and, where possible, hot water should be available. Soap and disposable hand towels should be provided in the hand washing area.

### Sinks

Potable water must be supplied to all sink areas. Hot water should be used where possible. An appropriate detergent and sanitizer should be used to adequately clean all sinks.

### Food Supplies

Foods used should come only from registered outlets and should not be prepared in domestic kitchens. Food proprietors must ensure that food supplies have been prepared and transported in accordance with relevant standards.

### Transporting Food

The time required for food transportation should be kept to a minimum. Temperature requirements should be maintained, and the food should be protected from contamination at all times.

Food transport vehicles should be clearly identified and subject to surveillance and monitoring.

### Food-Handling

Essential matters to address include the following:

*Cross-Contamination* — The following points apply:

- Every effort should be made to minimize the risk of cross-contamination during the food handling process. Food utensils and surfaces used for the preparation of raw and ready-to-eat food should be clearly distinguished. In cramped circumstances, this distinction becomes more difficult to observe. Adequate cleaning and sanitizing of food utensils and surfaces between uses plays an important role in reducing problems arising from cross-contamination.
- Disposable, plastic gloves should be worn and changed frequently. The temptation to continue to wear the same gloves exists, even after the work being undertaken has changed. Encourage frequent hand washing.
- Appropriate food storage is critical to ensure there is no contamination between raw and cooked or ready to eat foods. Raw foods should be stored separately if possible, or at a minimum, stored below cooked or ready to eat foods.

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- Equipment must be adequately cleaned and sanitized between each separate process. This is particularly critical where equipment is used for preparing different food types.

**Thawing, Cooking, Heating, and Cooling**—The goal in monitoring temperature control is to minimize the time potentially hazardous foods are in the danger zone of 10°F to 127°F. Key points to remember include:

- Thaw food under refrigeration or in cold, running water.
- Cook food thoroughly to achieve a core temperature of 150°F.
- Minimize reheating of food. Where reheating is required, heat the food thoroughly and store above 127°F.
- Cool food quickly under refrigeration.
- Portion food into trays not more than 4 inches deep.

**Cleaning and Sanitizing**—The following points apply:

- Regardless of the type of facility in which the food is prepared, regularly clean and sanitize all food contact surfaces using an appropriate sanitizer. (Sodium hypochlorite, 100 - 200 ppm, is appropriate for this purpose.)
- Clean all other surfaces to minimize the risk of contamination of food products. Also be aware of pest infestation and occupational hazards, such as slippery floor surfaces.
- Consider the provision of a designated wash up area for food outlets to reduce sullage waste storage and pump out at each food outlet.

**Chemical Storage**—Store chemicals in areas separate from foods and clearly mark the contents on chemical storage containers. **Never use food containers to store chemicals.**

### **Food Storage**

Essential matters to address include:

- Storage Facilities—Provide facilities of adequate size and appropriateness for the purpose.
- Temperature Control—The following points apply:
  - Refrigerated or heated storage areas require a continuous power supply. You must store potentially hazardous food at temperatures below 10°F or above 127°F at all times.
  - Refrigeration can pose a problem particularly in hot weather when refrigeration units struggle to cope. In case of refrigeration failure, all proprietors should indicate alternative refrigeration suppliers, or the organizer or authority could identify alternative suppliers in the public health emergency management plan.

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- Cross-Contamination —The following problems must be overcome:
  - The less than ideal conditions that confront food handlers working in temporary facilities may lead to a compromise in appropriate food handling practices.
  - Space is often a major problem. Ensure that, at a minimum, raw and cooked or ready-to-eat-foods are stored appropriately. Food handling staff must be aware of the requirements for strict hand washing and for the cleaning and sanitizing of equipment between handling raw and ready to eat foods.
- Dry Goods —Appropriate and sufficient storage conditions should be available to ensure adequate protection of food from the elements and pests.
- Food Protection —Protect exposed food available on display from insect pests, dust, and human contact.

### *Food Handling Staff Considerations*

Important matters to address include:

- Training—Encourage proprietors to select staff with food handler training to work in temporary facilities.
- Personal Hygiene—Selection of staff should include factors such as high personal hygiene standards. Food proprietors should ensure that a non-smoking policy is implemented in the workplace.
- Communications—Proprietors should be able to demonstrate that they have an efficient reporting and communication system so that staff can identify public health problems and deal with them promptly.
- Supervision—Encourage proprietors to provide appropriate supervision to ensure a team approach to the provision of a safe food supply.
- Dress—Food handler’s dress should be appropriate to the task they are performing and include some form of hair covering.
- Infectious Diseases—
  - Proprietors should be reminded that food handlers must not work while they are in an acute stage of any gastrointestinal illness or the common cold.
  - Proprietors should remind food handlers who have open wounds to dress all wounds with a waterproof dressing and to change the dressing regularly.
  - Provide segregated toilet facilities exclusively for food handlers.
  - Monitor these facilities for any signs of pest or rodent infestation.
  - Proprietors should keep a register of any complaints that they may receive from food purchasers.

A sample “Checklist for Food Vendors” form appears in the appendix.

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### **Health Promotion**

Consider the opportunities to promote health messages at public events and to encourage event organizers and service providers, such as food vendors, to participate. Examples include:

Sunsmart—Encourage the provision and use of shade areas. Encourage the use of sunscreen creams and hats, and make them available for purchase by spectators.

No Smoking—Encourage the provision of non-smoking areas and ban the sale of cigarettes at the event.

Nutrition—Encourage food proprietors to provide nutritious foods. Encourage event organizers to select food vendors that provide nutritious food varieties.

Safe Sex—At certain events, the promoter may wish to convey safe sex messages and consider providing free condoms.

Alcohol—Consider the designation of alcohol-free areas or restrictions on the sale of alcohol. Also consider glass-free policies. Alcohol-free events will minimize aggressive behavior of spectators and also minimize the use of restrooms and water supply needs.

Drugs—Consider opportunities to spread anti-drug abuse messages.

Hearing Protection—Consider providing advice about hearing protection and possibly free ear plugs to spectators and participants. Providing hearing protection is especially applicable at venues such as rock concerts and car races.

### **Water**

An adequate supply of safe drinking water must be available. One guideline suggests making available 21 quarts of potable water per person per day, of which 5 quarts is the drinking water component. Consider event duration and location and the anticipated ambient temperature in determining the quantity of potable water required.

All water provided must be tested to ensure its potability. In areas where non-reticulated water is the only source for personal use, then consider the clarification and disinfecting of the water supply to achieve a level greater than 1 ppm residual chlorine.

Some consideration must be made to ensure the water is safe from deliberate contamination. Placing the water supply in a secure area or having someone guard the water supply are two options available.

Appropriate access to drinking water must be available for spectators in a field or outdoor venue or at events such as “raves,” where the activity produces an extreme heat environment.

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Water pressure must be adequate to provide for all normal use and for use during peak demands. Alternate water supplies must be available should existing supplies fail to meet demand or should the supply be rendered unsafe or unusable.

### Toilets

Where existing toilet facilities are judged inadequate, you must make available additional portable units.

Toilet locations should be:

- Well-marked;
- Well-lit (including the surrounding area) if night use is anticipated;
- Serviced (including pump-out of portables) on a 24-hour schedule during the event (vehicle access is obviously necessary);
- Located away from food storage and food service areas; and
- Secured to prevent tipping.

Toilets are a useful area in which to also make available facilities to:

- Provide for the safe disposal of needles, syringes, and other sharps; and
- If appropriate, provide condoms at some events.

The following considerations will determine the number of toilets to be provided for particular events:

- Duration of the event,
- Type of crowd,
- Weather conditions,
- Whether the event is pre-ticketed and numbers known or unticketed,
- Whether finishing times are staggered if the event has multi-functions, and
- Whether alcohol will be consumed.

Calculating the number of toilets required for an event is a matter for conjecture. Where local laws or regulations do not exist, the following guidelines can be applied. Better management of events can be achieved by providing additional facilities. Assume a 50/50 male/female split unless otherwise advised. The following tables should only be used as a guide.

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### Toilet facilities for events where alcohol is not available

|         | Males   |         |       | Females |       |
|---------|---------|---------|-------|---------|-------|
| Patrons | Toilets | Urinals | Sinks | Toilets | Sinks |
| <500    | 1       | 2       | 2     | 6       | 2     |
| <1000   | 2       | 4       | 4     | 9       | 4     |
| <2000   | 4       | 8       | 6     | 12      | 6     |
| <3000   | 6       | 15      | 10    | 18      | 10    |
| <5000   | 8       | 25      | 17    | 30      | 17    |

### Toilet facilities for events where alcohol is available

|         | Males   |         |       | Females |       |
|---------|---------|---------|-------|---------|-------|
| Patrons | Toilets | Urinals | Sinks | Toilets | Sinks |
| <500    | 3       | 8       | 2     | 13      | 2     |
| <1000   | 5       | 10      | 4     | 16      | 4     |
| <2000   | 9       | 15      | 7     | 18      | 7     |
| <3000   | 10      | 20      | 14    | 22      | 14    |
| <5000   | 12      | 30      | 20    | 40      | 20    |

These figures may be reduced for shorter duration events as follows:

| Duration of event | Quantity required |
|-------------------|-------------------|
| More than 8 hrs   | 100%              |
| 6-8 hrs           | 80%               |
| 4-6 hrs           | 75%               |
| Less than 4 hrs   | 70%               |

### *Toilets for the Disabled*

At least one unisex toilet for the disabled is required. Check with your local ADA office for further guidance.

### *Food Vendors' Toilets*

Separate toilet and hand washing facilities should be made available for food handlers.

### *General Considerations*

In an outdoor setting, it is a relatively simple matter to provide additional toilets by hiring temporary, portable toilets. This solution may not be suitable for indoor settings, for which provision of additional toilets may be more difficult. One possible solution is to convert some men's washrooms to women's for events where you anticipate a predominantly female audience, or vice versa.

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In order to avoid long lines, particularly at female toilets, organizers may identify some toilet facilities as unisex toilets.

Maintenance and cleaning schedule for toilets and sinks should ensure:

- An adequate supply of toilet paper and soap,
- Clean toilets throughout the duration of the event,
- Provision for disposal and removal of sanitary napkins, and
- Availability of a plumber or appropriate maintenance person to repair or remove blockages.

Organizers should ensure that adequate cleaning supplies are available for use by the cleaning staff.

### Showers

At an extended event, promoters and planners may decide to provide showers. If they do provide showers, they must consider the additional demands for potable water and drainage. If municipal water supplies and wastewater treatment plants cannot service the shower facilities, providing shower facilities could prove to be a very costly and formidable task. Ensure that showers are located on high ground so that muddy areas are not created.

### **Solid and Liquid Waste Management**

Major considerations are as follows:

#### Food Waste

- Deposit food waste in covered containers placed strategically around the venue. Covers are essential, especially in outdoor settings or if high temperatures are expected.
- Spectator density may prohibit access by garbage removal vehicles. To prevent containers from overflowing, empty containers regularly and move waste to a temporary, properly prepared holding area until bulk removal can be accomplished at designated times or after the event. Removing food waste often and in a timely manner prevents other diseases and pests.

#### Empty Containers

Make arrangements for the appropriate storage or disposal of empty containers, such as cardboard boxes.

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### Hazardous Wastes

Special arrangements must be established for the collection and disposal of various forms of hazardous waste, including waste from food preparation areas, medical sharps, and other hazardous materials.

### Clinical Waste

Ensure there is provision for the storage, collection, and disposal of clinical waste generated from onsite medical and first aid facilities.

### Sewage and Sullage

Provide and maintain adequate facilities for the ongoing storage and disposal of sewage and sullage. As with all other wastes, this must be removed in a timely manner and on a frequent basis.

### Recycling

Where possible, consider providing specific containers for recyclable materials. Vendors should be encouraged to use recyclable packaging of foodstuffs. A sufficient number of dedicated containers should be placed near the vendor area to further encourage recycling.

### **Animals, Rodents, and Vegetation**

In outdoor settings, the control of rodents, snakes, spiders, mosquitoes, and insects of significance to public health must be addressed. If particular hazardous species are known to inhabit the area, or if carriers of particular diseases are prevalent in the area, alert the attending first aid and medical personnel.

Alert medical and first aid personnel to the presence of potentially poisonous and noxious plants and trees in the area.

If domestic animals are permitted into the venue, establish rules for the control of animals and their waste. Check with your local animal control or shelter for more guidance concerning animal regulations.

Also consider the potential effect of the event on nearby domestic or farm animals and native fauna.

### **Swimming and Water Safety**

Purpose-built swimming areas must comply with state requirements for water quality and meet other local requirements, such as fencing. Assess the suitability of other watercourses in the vicinity of the venue if spectators may use those watercourses for water recreation or washing. If these watercourses do not meet requirements, fence them off and erect warning signs against their use.



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Address water quality in both designated swimming areas and areas that could be used for swimming in hot weather. Experience has shown that where audiences attend an outdoor concert in hot weather, particularly in overnight events without adequate or convenient washing facilities, they will employ any nearby water area as a makeshift swimming, bathing, or washing area.

Consider making available some form of trained supervision for:

- Families with small children;
- Spectator groups for which alcohol consumption, with subsequent judgment impairment, is anticipated; and
- Areas of water that pose additional hazards such as steep, slippery sides; submerged snags, or unusually variable depths.

### **Infection Control and Personal Hygiene Concerns**

Infectious disease transmission through unsafe sexual practices or drug use may be a health risk at some events, particularly for those at which spectators are camping at the venue overnight. To reduce these risks, consider providing or making available condoms and a properly licensed needle exchange/disposal mechanism. While these are sensitive and controversial issues, and political issues in some areas, they are nevertheless important public health concerns in contemporary society, and you should address them.

At events where the duration extends overnight or longer, provide hygienic washing facilities. Suggested minimum requirements for facilities at campgrounds, based on two to three nights' camping, are as follows:

| Sex | Toilets  | Urinal    | Sinks    | Shower    |
|-----|----------|-----------|----------|-----------|
| M   | 1 per 50 | 1 per 100 | 1 per 75 | 1 per 100 |
| F   | 1 per 25 | N/A       | 1 per 75 | 1 per 100 |

### **Tattooing and Body Piercing**

With a return in popularity of tattoos, body piercing, and branding, mobile operators have begun to appear at certain types of public gatherings, such as carnivals, motorcycle races, and auto swap meets. Where this activity is likely to occur, check the need for proper licensing or registration of such service providers and their compliance with any health legislation.

Due to the potential of cross-infection, particularly of blood-borne diseases, inspect any such operations to ensure, as a minimum, the use of:

- Disposable, single-use skin penetration items,
- Proper sterilization equipment and techniques,
- Clinical sharps containers for used needle disposal, and
- Sharps containers safely located away from children.

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If the service providers do not use these minimum infection control procedures, do not allow them to perform any skin penetration procedures.

### **Post-event Public Health Survey**

Conduct a post-event survey to ensure that personnel have conducted a proper clean up, particularly from a public health perspective. For example, check that all scrap foodstuffs and discarded needles are properly disposed of. All involved in planning the event should return the venue to its pre-event condition.

When the event includes fireworks, conduct a diligent search for any unexploded fireworks. Before you allow public access to the area, safely collect and remove any unexploded fireworks.

As an additional precaution, retain appropriate records of all service providers at the event so that they may be traced should some subsequent outbreak of a notifiable disease occur or if a claim is made for an injury or illness.

Health personnel should also be conscious of the need to introduce a monitoring or surveillance system should they subsequently become aware of any particular health problem arising from an event.

A formal public health debriefing should follow the event, and a public health representative should participate in all agency debriefings.

### **MEDICAL CARE**

Spectators and participants at mass gatherings may require medical attention in the event of illness or injury. The incidence of illness will be greater at an event for spectators than that expected to occur naturally in a population of comparable size.

The number of spectators who require, or avail themselves of, onsite medical care, and the types of problems they present, will vary significantly depending on the nature of the event. While high-risk events such as air shows have caused significant loss of life (for example, the 1988 Ramstein Air Base air show crash), statistically, rock concerts have generated large numbers of casualties with less severe injuries and illness. Between 0.5% to 1.5% of concert goers will require some form of medical assistance, regardless of the character, locale, physical layout, and size of the concert.

Alcohol and drug use is common at most festivals and is the primary diagnosis in greater than 10 per cent of the persons seeking medical care. Other common complaints include lacerations, fractures and sprains, burns, sunburn, heat stroke, seizures, asthma, and exposure.

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### Medical Care Provision

Planning for the provision of medical care for both spectators and participants is essential, for both humanitarian and legal reasons. In addition, providing onsite first aid or medical care will significantly reduce the demand made on the emergency departments at local hospitals in the area of the event.

Event organizers may choose to contract with a health service provider, who may not be associated with the normal local service provider. Check to ensure that the service provider meets the local emergency standard. The provider must coordinate with the local health and emergency services to plan a response to any emergency or significant medical problems requiring further assistance. Notify local health authorities of the details of the event and provide them with emergency plans for a major incident.

### Main Concerns in Planning Medical Care

Main issues to address in medical care planning include:

#### Logistics

Some medical logistics questions to consider in planning an event include:

- Will medical personnel operate in a facility to which the injured must make their way, or will clearly identified medical teams patrol spectator areas?
- Will vehicles be available to transport spectators to the medical facility?
- Will medical vehicles be appropriate to the terrain? Four-wheel-drive vehicles may be required for off-road areas and golf carts or similar vehicles required for high-density spectator areas.
- Where an ambulance is not required, will a “chauffeur system” be provided to transport persons from the onsite medical facility to their own transport vehicle?
- How will medical personnel be notified of, or summoned to, spectators requiring assistance in vast spectator areas?
- What means of communication will be available to permit attending medical personnel to communicate with offsite medical personnel, event organizers, security, and other support personnel?
- Are there any sponsorship conflicts between the event sponsor and any medical service operators?
- What level of onsite medical care, if any, do you expect to be required, given the nature of the event?
- What mix of medical personnel (first aid providers, paramedics, nurses, doctors) will you require on site?
- Who will provide the personnel? How will the cost for their services be funded?
- Are the health service providers from the local area? If not, how will their services be integrated with the local services?
- Are the selected personnel appropriately skilled to respond to anticipated medical problems at the event? They may require additional training.

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- Will medical personnel or vehicles need special credentials to allow them access to all parts of the venue, especially to any restricted areas?
- Are medical personnel assigned for public safety workers at the event?
- Are air ambulances available?
- Where is the closest trauma center?
- Does the area hospital have adequate bed and personnel capacity to respond to the emergency requirements of an event the size being planned?

### Management and Planning (see the appendix for checklists):

- Determine which other organizations will be involved. Who will be the lead agency?
- Conduct planning meetings involving health personnel, emergency services personnel, and event organizers.
- Determine what is expected of each organization involved in the provision of medical care.
- Determine likely levels of care that will be required.
- Determine any local laws, rules, or regulations governing emergency first aid.
- Determine the budget for the provision of medical care services.
- Establish liaison with other emergency services (police, fire, and security).
- Identify equipment required and potential suppliers. Will the equipment be purchased, hired, or borrowed?
- Will volunteers be used? What accreditation will they be required to possess? What inducements will be offered?
- Ensure security of medical stations and safety of staff.

### Planning Information

Obtain background information to assist with medical care planning available from:

- Reports from previous, similar events (medical and other specialist literature), and
- Lay literature (press).
- Medical literature that has information on risks and types of injury sustained at similar events in the past.

Consider effects of weather conditions on the spectators, such as hypothermia and heat stroke.

Consult medical literature for information on numbers of casualties from similar events in the past. See the table below for anticipated percentages of patients against triage categories. Consider variables that affect numbers, for example, alcohol consumption, psychosocial behavior, and type of event.

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### Expected percentages of patients in triage categories

| Categories <sup>1</sup> | Description | Vital Signs             | Mental State            | Percentage <sup>2</sup><br>% |
|-------------------------|-------------|-------------------------|-------------------------|------------------------------|
| 1                       | Critical    | Unstable                | Abnormal                | 0.02                         |
| 2                       | Serious     | Potentially<br>Unstable | Potentially<br>Abnormal | 1.1                          |
| 3                       | Moderate    | Usually<br>Stable       | Normal                  | 12                           |
| 4                       | Minor       | Stable                  | Normal                  | 87                           |

Notes: <sup>1</sup> Categories modified from disaster triage guidelines.

<sup>2</sup> Percentages aggregated from events listed in the references.

### Medical Access to Venue

Consider risks associated with venue, for example, water in the vicinity.

Agreements must be reached among medical service providers on the following:

- Medical teams must be able to easily locate individuals in need of attention. You should agree on the use of a common reference map or grid system.
- How will medical teams reach or rescue individuals in distress, for example, in crowded areas or through fixed seating?
- How will patients be transported on site?
- Will you provide a dedicated access route, or emergency service lane, to allow rapid access to and from the venue for ambulances and other emergency vehicles?
- Will the event itself pose a barrier to medical teams, for example, community runs or a parade?
- Will you need aero-medical services, and if so, what are the associated regulations regarding their operation?

### Medical Requirements

- Prepare for the most critical injury or illness foreseeable, such as cardiac arrest.
- Is there a need for a mobile team? This team may require pre-packed medical kits.
- Determine who will provide care for the audience, any VIPs, and performers.
- Define boundaries of care, for example, inside the venue and in the parking areas.

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### Level of Care

Categorized as follows:

- Basic—first aid;
- Intermediate—first aid plus IV therapy and oxygen;
- Advanced—Care and life support and early management of severe trauma; and
- Site Hospital—full monitoring and ventilation. A surgical facility may be required depending on the level/type of event.

Other level-of-care concerns include:

- Consulting medical personnel with experience of similar events to determine appropriate levels of care to provide;
- Considering the distance to, and accessibility of, the nearest hospital and its capability; and
- Pre-establishing the coordination between venue medical services and those of the local community emergency medical service responders (that is, establish how they will provide mutual aid if required).

Further guidance on the establishment of medical care facilities and their equipment requirements is available in the references and from local or regional disaster and health plans.

### **Medical Teams**

When deploying medical teams, consider the following:

- Event size;
- Location with regard to medical infrastructure;
- Available medical resources;
- Local ordinances;
- How many teams are needed? For example, is one ambulance per 10,000 people and 1-2 doctors per 50,000 too much or not enough?
- Who can see, treat, and discharge patients?
- Will there be peak periods or special circumstances requiring additional staff?
- How will medical staff be fed, watered, rested, and protected from the elements?
- Are work safety regulations established that cover occupational health and safety (for example, protection from violence and crowd crushes)?
- Have medical teams been provided with maps of the venue?
- What arrangements are in place for movement of medical teams onto and off the site?
- Are medical team members appropriately dressed for the conditions?
- Is the dress of medical team members easily identifiable?
- Are interpreters required?
- Do medical teams understand the command structure and their role within it, and the emergency activation system?

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### Mobile Teams

In tightly packed areas, particularly near the stage, First Aiders on foot, bicycles, or golf carts may have the only access. Experience has shown that uniformed First Aiders on foot circulating in dense spectator areas are quite effective, and patrons will readily summon them in an emergency, even if the person requiring care is a stranger to them. Even if a clearly marked field hospital is visible, spectators are often unwilling to make the sometimes long trek to request assistance (since they may lose their seating position), particularly for a fellow spectator whom they may not know or if they fail to appreciate the seriousness of the patient's condition.

Identification of mobile teams, where ambulance or clinical uniforms are unsuitable, can be successfully accomplished by special "event uniforms." Mobile teams need to have communication equipment to keep EMS supervisors and the Command Post informed at all times.

(NOTE: The Red Cross symbol is registered by the International Red Cross and its National Societies. It should not be used as part of an "event uniform.")

### Medical Aid Posts

Important considerations in the establishment of medical aid posts require that they should:

- Provide easy ambulance access and egress;
- Be located within 5 minutes of all sections of the crowd;
- Have available a mode of transport to them;
- Be clearly sign-posted from all directions;
- Be clearly identified;
- Be clearly marked on maps of layout;
- Be in a position known by security and other event personnel;
- Be stocked and staffed for the duration of the event and for spectator arrival and departure periods;
- Provide facilities for injured or sick patients to lie down;
- Ensure privacy in clinical areas;
- Provide some means of communication with the primary medical control point, venue control, and with mobile medical teams in the venue; and
- Be located in as quiet a place as possible.

### Site Hospital

Depending on the nature of the event, a site or field hospital may be needed to provide care for the number of casualties anticipated. You should also make contingency plans in case of a major incident, for which the resources of the field hospital may not be sufficient. Failure to plan for large numbers of casualties or severely injured patrons can result in long delays in providing medical treatment. It is important to provide a communication link between the site hospital and local hospitals.

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Site hospitals will require:

- Clean water;
- Electricity for medical appliances and adequate lighting in tent hospitals at night (this installation should, if possible, include a backup power system);
- Washroom/rest facilities for the exclusive use of staff and patients;
- Meals for medical staff;
- Tents for hospital use that have flooring as part of the structure to contain the service and to prevent ingress of water or insects;
- A landline telephone service for ordering of additional staff or supplies and for notifying hospitals of patient transfers (note that cellular telephones should be used as backup devices only);
- Reserved access roads for emergency vehicle use; and
- Dedicated disposal containers for ablutions, hazardous wastes, and sharps.

### **Documentation**

Documentation should facilitate:

- Post-event review of medical assistance activities, and
- Tracking of biological, chemical, and infectious disease exposures should they occur.

Medical-legal issues, which must be addressed prior to the preparation of any documents, are as follows:

- Who has access to records?
- Who keeps the data and for how long?
- Who can give consent for treatment?

### **Ambulance Vehicles**

Organizers should consult ambulance services to determine ambulance requirements for the event. Some considerations include:

- Will ambulances be pre-positioned on site or be called to the venue on an as-required basis?
- Providing a mix of Advanced and Basic Life Saving ambulances at the event.
- If ambulances are on site for participants (for example, at sporting events), are these ambulances exclusively for taking care of participants' needs or emergencies, or will they be available for injured spectators as well?
- Are air ambulances available? Who will pay for the service? Can the promoter be made to provide the service?

While conventional ambulances are appropriate for patient transfers to offsite medical facilities over good roads, such vehicles may be unsuitable for off-road use. Ad hoc roadways and cross-country terrain may require four-wheel drive vehicles, particularly if grounds are saturated by recent rainfall. Since four-wheel-drive ambulances are not available



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in most areas, other four-wheel-drive vehicles, equipped with appropriate medical equipment (including, but not limited to, resuscitation equipment, trauma kit, and spinal board) can serve as ambulances over the short distances between spectator areas and medical care facilities.

In denser spectator areas, any vehicle can have access problems. You should consider using golf carts, either designed or modified to accept stretcher cases from these areas.

For these reasons the ambulance network may have to consist of a mix of First Aiders on foot, golf-carts, four-wheel drive vehicles, ambulance buses, and conventional ambulances, to best facilitate patient transport requirements. You should provide a magnetic-based beacon, portable radio, and appropriate marking for these vehicles.

A communication network, designed to provide a coordinated response to requests for assistance, is essential. You may base the network on existing service networks, or event organizers may need to provide the network.

### **Medical Equipment**

The requirement for basic or advanced life support equipment depends on the type of event and the assessed risk of illness or injury. While standard lists of equipment will cover most requirements, you should review literature, previous experiences, and current practices.

Further equipment considerations include:

- Mobile versus fixed requirements,
- Arrangements to re-supply aid posts as required, and
- Compatibility of onsite equipment with equipment used by ambulance and other health care providers.

### **Other Medical Considerations**

Further considerations include:

- Providing a separate facility and staff to counsel victims of sexual assault and also to collect evidence;
- Ensuring sufficient water supplies;
- Providing sprinkler systems or misting tents for crowds in hot, open areas, if they are suitable for the event;
- Providing welfare and information services (the helping and caring role);
- Assisting with forgotten medications;
- Providing a baby diaper-changing and caring facility; and
- Containing and disposing of clinical waste.
- How, and by whom, will medical supplies be obtained, including secure onsite storage of drugs?

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### **Toxicity Laboratory**

Offering medical assistance to an overdose victim at a rock concert poses a major difficulty in making appropriate field diagnosis when the caregivers do not know the drug, the dosage, or the potency of the drug. Even when victims are coherent, they may believe they took a particular drug when, in reality, they took a different drug or one that was adulterated. As is well documented, there is no quality control, or ethics, in the dealing of street drugs.

To attempt to cope with onsite drug identification, medical staff at the Watkins Glen, New York, rock concert (July 26-29, 1973, estimated attendance 600,000) established a mobile toxicology laboratory on site in a trailer adjacent to the hospital tent. Apparently, this is the first time such a lab was included as part of the medical facility at a rock concert.

The benefits of an onsite mobile toxicity lab include triage of drug overdose cases for removal to hospitals, as well as reducing such numbers to be transported, which otherwise would be necessary, without toxicological diagnosis confirmation in the field.

## **ENVIRONMENTAL CONCERNS**

### **Weather**

Weather is a variable that takes on a different significance depending on the event and its location. For a major indoor event in a southern United States city, weather is seldom a major concern, unless a natural disaster, such as a hurricane, is anticipated. If you were to move that same event to a northern United States climate in February, you would be faced with additional concerns, sometimes even for a predicted “normal” winter storm. Slow moving traffic patterns, snow removal in parking areas, and safe movement of spectators from parking areas to the venue are a few concerns. Extreme high and low temperatures must be part of the contingency planning for an event. These extremes present hazards and risks not normally present but which must be considered.

In outdoor events, many additional concerns may become apparent regardless of location. Lightning strikes, severe thunderstorms and hail, high winds, and other undesirable weather pose threats to event patrons. The influx of patrons may have a severe negative impact on the jurisdiction’s mass evacuation and sheltering plan for local residents. Contingency plans drawn up for the jurisdiction may not provide for a transient population (as in the case of some rock concerts in the hundreds of thousands) that will negatively impact that community’s ability to protect residents and visitors.

During the planning phase, event organizers must adequately consider all potential weather conditions. For example, many concerns about weather were given consideration by planners for the 1999 Woodstock Festival held at the former Griffis Air Force Base in Rome, New York.

Two stages were to be erected at Woodstock, one in excess of five stories high, made from steel construction staging. These stages were to be placed at opposite ends of the runways in

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large flat open spaces, in an area prone to thunder and lightning storms in mid-July of any given year. Electrical professionals were posed the scenario of a lightning strike to the main stage by a swift moving thunderstorm, and asked worst case scenarios of what to expect. These professionals predicted that not only could anyone on the stage or scaffolding be prone to electrocution, but many spectators on the ground around the stage could also be in danger (depending on the location of the strike with the scaffolding, any grounding mechanisms in place, and the severity of the storm). Local contingency plans for sheltering also did not take into consideration the additional 250,000 people (the estimated attendance at this festival) that the city of Rome or county of Oneida would be expected to protect.

Some considerations planners may wish to make regarding the weather are:

- Monitoring the weather using a computer, radio, or television;
- Establishing a dedicated a phone line that was linked with the closest office of the National Weather Service;
- Ensuring that ICS team consults with the Weather Service on a regular basis and that consultation information is included in each operational period Incident Action Plan;
- Distribute weather information to the participants;
- Contract or partner with a private sector meteorological prediction service;
- Establishing agreements with the promoter to interrupt a performance and use the festival sound equipment as a public address system to give information to patrons on protective actions to take should severe weather be imminent; and
- Coordinating with the Red Cross and concert organizers to dedicate specific buildings as evacuation shelters should the visiting public to the area require sheltering.

Developing severe weather contingency plans to ensure the safety of event attendees can require a significant amount of time, equipment, planning, and multi-agency participation.

### **Site Hazards**

In selecting a site, especially for an outdoor event, the planning team should identify the potential hazards in the area, which include:

- Power lines that could be brought down by a severe storm;
- Structures and equipment prone to lightning strikes;
- Waterways that may be prone to flooding;
- Brushfires;
- High winds;
- Extremes of temperature;
- Pests, large animals, pollens, and poisonous plants, including:
  - Rodents,
  - Insects—ants, caterpillars, wasps, bees, mosquitoes, flies,
  - Snakes,
  - Spiders, and
  - Noxious weeds;

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- Marshes or swamps;
- Quarries, pits;
- Scrap piles;
- Cliffs and steep inclines;
- Water courses, depth of water, water currents, water temperature, water clarity;
- Pollution—dust, noise;
- Water quality (bacteriological), blue green algae;
- Darkness;
- Hazardous chemicals or underground tanks;
- Use of lasers;
- Alcohol, drugs, weapons, or potential weapons (for example, broken glass);
- UV radiation; and
- Neighboring land use.

### **Environmental Impact Concerns/Maintaining Compliance**

To ensure compliance with public health requirements, carry out a public health audit just prior to the commencement of the event. Also undertake subsequent periodic surveillance during the event. These procedures are particularly important for outdoor events in hot weather with transient food vendors who may not have sufficient sanitary or refrigeration mechanisms available or established public health or safety protocols.

Environmental health officers should have access to resources to assist in early intervention when any problem is noted (for example, toilet servicing, unsafe areas, fencing repairs, water testing) rather than using their powers to stop the event or particular operation.

### **AIRCRAFT**

If helicopter flights will be available for spectators or members of the media to view the event from the air, the following concerns should be addressed:

- Will flights be prohibited directly over the event and spectators and confined, instead, to circular paths around the perimeter?
- Will staging areas or heliports be confined to the periphery of the event, to avoid flights directly above spectators during take-offs and landings?
- Does the proposed staging area or heliport comply with federal regulations governing such use?
- Which public safety agency working the event will be designated as responsible for interacting with the FAA if required?

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### SPONTANEOUS EVENTS OCCURRING AT PLANNED EVENTS

As the title for this section suggests, organizers cannot plan for or anticipate every crisis. However, you can take certain measures to ensure personnel safety. For example, if a stand collapses, the fire department uses an established, practiced procedure to remove the injured and to cordon off the area. This procedure will not change because the stand collapses at a spontaneous event. Contingency plans, modeled on established procedures, need to be in place for demonstrations, protests, or picketing that may occur during a planned event. Train for the worst and respond to your training. Plan for the worst, and you can handle even the unexpected events in an orderly manner. Designate specific incident resources in advance to respond to spontaneous events as they may occur. During event planning, brainstorm a list of potential spontaneous events most likely to occur.

### CAMPING

If you permit camping at the event, you should consider the following:

- Providing for the safety of the campers and their belongings,
- Disposing of solid and liquid waste,
- Clearly marking temporary streets,
- Clearly defining avenues of access for ambulances, law enforcement, and other emergency vehicles,
- Controlling the building of fires'
- Removing fire hazards ahead of time, and
- Installing a public address system to communicate emergencies to campers.

Survey proposed camping areas to ascertain their safety, paying particular attention to:

- Low-lying areas subject to flooding,
- Areas adjacent to creeks or rivers,
- Areas near utility lines, and
- Trees that may drop branches, especially during a severe storm.

### HAZARDOUS MATERIALS (HAZMAT)

The nature of some events causes concerns over hazardous materials and the ability of local officials to handle such incidents (for example, propane gas cylinders used for cooking and pyrotechnic lighting areas). In most communities the fire department is the agency set up to respond to hazardous materials calls. The best way to plan for disposal of hazardous materials is to inform the fire department ahead of time about potential hazards and their locations. Providing a brief strip map with a description of the possible hazard reduces the response time and allows the responder to be prepared. If the local fire company is not

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adequately trained or equipped to handle the hazardous material, planners must identify in advance the closest department that is equipped and consider staging them close by during the event.

### **Gas Cylinder Anchorage**

At many public events, portable pressurized gas cylinders are used to inflate children's balloons, to carbonate beverages, or to provide cooking fuel. Frequently, such cylinders are not secured, or are merely fastened to two-wheeled hand trolleys designed to transport them, which are themselves not independently secured.

If such cylinders topple and the cylinder neck or valve cracks, the uncontrolled release of the stored, pressurized gas can turn the cylinder into a deadly projectile. For this reason, all portable gas cylinders must be secured.

### **Propane Leakage**

Used incorrectly, propane can be deadly. Propane is a flammable material that is heavier than air used for cooking at many large events. Tanks must be properly secured. Qualified inspectors, usually from the fire service, should also make periodic inspections of the tanks to ensure that the location is a safe distance away from heat sources or other possible sources of danger.

### **Ability of Public Sector to Respond**

During the planning stages of an event, it is very important that you discuss with your local public safety providers exactly what agency is responsible for which response and know the capabilities of the local responders. In some communities the fire department is responsible for HazMat response; other communities have HazMat teams, and some use the state assets for response. Learn your community's capabilities and HazMat protocol before they are needed and consider staging them close by for the event if the primary responders are not associated with the local jurisdiction.

## **ELECTRICAL UTILITY COORDINATION REQUIREMENTS**

Participants, spectators, and event staff are all affected by lighting, which is needed to setup, tear down, and ensure the safety of the event. Make certain that lighting is adequate and that the power supply to provide the lighting for the event, campgrounds, and parking areas is adequate.

Even in venues that are darkened for performances, lighting should always be in use to identify exits as well as the corridors and aisles leading to them. All temporary electrical facilities should be inspected and approved by a local government inspector to ensure the safety of all.

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Install auxiliary battery power or generators to provide light and to power the public address system in a power outage. You must be able to give information and directions to spectators during a power failure to alleviate panic.

Because many concerts are performed with only stage lighting, event staff access to the main lighting board or house lights console is essential in case of an emergency. Onsite personnel responsible for dealing with emergencies must know the location of the controls for these lights and how to operate them.

### **FIRE SAFETY**

All states and territories have legislation governing fire safety. The local fire authority should monitor fire prevention and preparedness plans to ensure that the measures taken meet relevant standards. Organizers and health personnel should consider potential fire hazards in the planning process and discuss any concerns they may have with the fire authority. Fire and law enforcement should determine in advance how they will handle a civil disturbance or riot involving fire-setting behavior and have contingency plans in place. For example, a team of police officers may be assigned to accompany each engine sent out to quell a fire set by rioters.

Site design should be such as to mitigate fire hazards. For example, clear storage areas, timeliness in picking up trash, construction of metal rather than wood, no open flames, and control of pyrotechnics, assist in fire mitigation.

### **COMMUNICATIONS SYSTEMS**

A means of communicating with the crowd is essential at all events. Ideally, you should establish multiple communications systems to enable messages to be directed at different sections of the crowd, including crowds massed outside the venue. The Command Post should have access to the central communications system.

Before the event begins, establish appropriate arrangements for communications should an emergency arise. If emergency personnel will use a separate sound system, they need some means of muting or silencing the stage sound system. Also, consider the use of signboards throughout the venue as an enhancement to the public address system.

Because public announcements are an important element of the safety plan for an event, consider the style and content of announcements, as follows:

- At what volume level can announcements be heard over spectator noise?
- Will the audience easily understand announcements?
- Are multiple language announcements required?
- What wording will lend credibility to the instructions?

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If public address systems cannot be put in place outside the venue, personnel can use the public address systems that form part of the electronic siren system in most emergency vehicles.

Closed circuit television is another option available for organizers to provide visual information to the public.

### **Two-Way Communication**

While it goes without saying that the various emergency services (police, health, fire) must be able to communicate with their own staffs, experience has shown that different services must be able to:

- Communicate with each other;
- Communicate between staff outside and inside the venue to obtain a proper understanding of the nature or scope of an emergency; and
- Communicate with senior event organizers, including security, who may be the first to identify an incipient problem.

Some areas to consider are:

- Do not rely on cellular telephones;
- Ensure there is an integrated, multi-agency frequency for communications;
- Consider laying land lines for telephone service; and
- Using amateur radio operators for communications.

A central communications area (for example, a room or a trailer dedicated to this use) at the Incident Command Post with a representative from each major agency may facilitate the dissemination of vital information through the centralized monitoring of relevant radio communications.

Since a single system can fail, the communication system should be multi-modal. It should also be supplied with own backup power source.

### **Attendees' Personal Emergencies**

Some means should be established to contact spectators and for spectators to call outside the venue if necessary. Some events provide small booths staffed with volunteers to assist in message passing. Other events use the public address system. While yet others provide event brochures with emergency information inside. Select the most effective way to send messages at your event. If invited to, many phone companies often will provide a temporary bank of pay or credit card phones on the venue.

### **Event Public Address System**

Do not rely on the sound system used by the performers to serve the internal requirements and release information to the public. Sometimes those responsible for it have refused to authorize its use except during a change of performers so an alternate venue wide PA system